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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.                 | CONFIRMATION NO. |
|---|-------------|----------------------|-------------------------------------|------------------|
| 09/975,262  | 10/12/2001  | Naomichi Miyakawa    | 214814US0                           | 8858             |
| 22850   | 7590        | 01/15/2004           |                                     |                  |
| OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.<br>1940 DUKE STREET<br>ALEXANDRIA, VA 22314 |             |                      | EXAMINER<br>FIORILLA, CHRISTOPHER A |                  |
|   |             |                      | ART UNIT<br>1731                    | PAPER NUMBER     |

DATE MAILED: 01/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                     |                     |  |
|------------------------------|-------------------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b>              | <b>Applicant(s)</b> |  |
|                              | 09/975,262                          | MIYAKAWA, NAOMICHI  |  |
|                              | Examiner<br>Christopher A. Fiorilla | Art Unit<br>1731    |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on 28 October 2003.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1,2,4-6,9-12,15,17,19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1,2,4-6,9-12,15,17,19 and 20 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
 a) The translation of the foreign language provisional application has been received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.                    4) Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_

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1. Claims 1,2,4-6,9-12,15,17 and 19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not teach what is contemplated by the limitation "heat treating in an atmosphere containing substantially only nitrogen to one that contains no oxygen".
2. Claims 1,2,4-6,9-12,15,17 and 19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The original specification does not appear to support "heat treating in an atmosphere containing substantially only nitrogen to one that contains no oxygen".
3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
  - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
4. Claims 1,2,4,5,9-12,17,19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niwa et al. (5,688,728) in view of Apte et al. (5,902,429) for the reasons as set forth in the previous office action.

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5. Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niwa et al. (5,688,728) in view of Apté et al. (5,902,429) as applied to claims 1,2,4,5,9-12,17,19 and 20 above, and further in view of Watanabe et al. (5,833,917).
  
6. Applicant's arguments filed 10/28/03 have been fully considered but they are not persuasive.

**With respect to the rejection of the claims under 35 USC 112, first paragraph applicant argues:**

As to the question of whether the identified language in Claim 1 is meant to define a range, it is believed clear that the language pertaining to the atmosphere of nitrogen gas, in fact, identifies a range of gas from a nitrogen atmosphere that contains no oxygen to one which contains only very little oxygen. The nitrogen atmosphere should not contain amounts of oxygen that would result in conversion of the silicon nitride to oxide material. Thus, the meaning of the phrase is believed clear. Applicants point out that new Claim 20 has been presented which identifies the condition of the atmosphere as consisting essentially of nitrogen. This language only permits the presence of oxygen in the atmosphere in quantities that do not adversely affect the green body being heat-treated. Entry of the new claim into the record is respectfully requested.

As to the matter of support for the phrase in question, applicants refer to page 12, first paragraph, where suitable such support is found. Here it is clearly indicated that the nitrogen atmosphere employed contains either no oxygen or substantially comprises nitrogen only. Accordingly, the specification clearly enables the skilled artisan to practice the invention as claimed.

This argument is not persuasive. It is submitted that the phrase currently used in claim 1 and 9, i.e. "...an atmosphere containing substantially only nitrogen to one that contains no oxygen...". Is not supported by the disclosure. For example, an atmosphere, which contains no oxygen can be, for example, an argon atmosphere. The specification does not support sintering in an argon atmosphere. The specification requires a nitrogen atmosphere. Amending the claims

to read "...an atmosphere containing nitrogen only or substantially nitrogen and no oxygen..." would overcome the 112, first paragraph rejections.

**With respect to the rejection of the claims under 35 USC 103 applicant argues:**

The Niwa et al patent, as stated previously, discloses a porous ceramic product that possesses thermal shock resistance. The product is prepared by heating a raw material ceramic powder that is selected from a group of materials including silicon nitride. In the thermal process of forming the porous ceramic product, hollow oxide particulate material is used as the means of introducing porosity into the ceramic product obtained. The sintered product obtained is used as a valve unit that has high durability. The claims of the present invention, however, are clearly distinguished over the reference on the basis that the silicon nitride filter is directed to the specific aspect of being effective in the filtering of particulates from diesel fuel.

Applicants maintain that an important distinction between the present process as claimed in Claim 1 and the patent is that the pore-forming substance is spherical organic polymer particles of a size ranging from 20 to 100  $\mu\text{m}$ , whereas the patent clearly teaches hollow metal oxide particles as the pore forming agent. The particles are disclosed as having a size in the range from 20 to 250  $\mu\text{m}$  order to introduce the appropriate porosity into the product. On the other hand, the patent does not show a particulate, organic pore-forming material for the clear purpose of introducing pores into the ceramic product. In fact, the only disclosure of an organic material in the process of the patent is as a binder for the particulate mixture used as the starting material. As disclosed in column 7, lines 10-24, the organic material must be "burned off" or evaporated from the ceramic prior to any sintering of the ceramic. There is no pore forming function taught for the organic material. Moreover, as stated previously, there is a clear teaching in the patent, which leads the skilled artisan away from the use of organic binder material in the preparation of the porous product of the patent in the experiment described in columns 8 and 9. In the Comparative Examples 1 to 3, epoxy resin, acrylic resin and phenolic resin were used as binders said to be a replacement of the hollow metal oxide particles. The results in Table 1 in column 10 of the patent show that porous ceramic products of these three examples were obtained, all of which exhibited inferior thermal shock resistance, rate of  $\Delta T$  and sliding durability properties in comparison to Examples 1 and 2 of the patent where ceramic products were prepared from compositions containing hollow particles. Accordingly, with respect to Claim 1 as now claimed, Niwa et al does not suggest the method of Claim 1 of the present case.

This argument is not persuasive. It is agreed that at col. 7 of Niwa it is disclosed to use organic binders. This is not the portion of the reference relied upon by the examiner to teach the use of pore forming agents. In fact, in the office action the examiner directs applicant's attention

to col. 8, lines 66-67. Applicant refers to the portion of Niwa et al. at the bottom of col. 8 to the top of col. 9 wherein organic particles are substituted for hollow metal oxide particles, and stated that these organic particles are used as binders. This is inaccurate. Col. 10, lines 21-22, clearly recites "...the resin particles were used as the **pore forming medium...**". With respect to the physical properties (e.g. thermal shock) of the ceramic discussed by Niwa et al. it is submitted that these arguments are not commensurate in scope with the claims since these properties are not claimed in the present application.

**As to present Claim 9 as amended, the reference does not teach a silicon nitride filter that effectively filters particulates from diesel fuel whose porosity is from 30 to 80 wt % and whose average pore diameter ranges from 5 to 40  $\mu\text{m}$ . Accordingly, the patent does not teach or suggest the method embodiments of the invention.**

This argument is not persuasive. Niwa et al. teaches a porosity of 2-40% (col. 4, line 58) which lies within the claimed range and pore sizes of 5-300  $\mu\text{m}$  (col. 4, line 54) which encompasses the claimed range. Thus, since Niwa et al. teaches a product having the same properties and made from the same materials, its effectiveness as a diesel particulate filter must be the same as that of the claimed invention.

**Although the Apte et al patent discloses a method of manufacturing a porous ceramic such as of silicon nitride in which an organic agent is used a pore forming agent, nevertheless the process employed involves the preparation of ceramic preforms on a tape in which a colloidal suspension of ceramic particles and other components are spread on a tape. The colloidal solution may contain a pyrolyzable pore forming agent of which types are disclosed at column 7, lines 37-39. However, in the present process a mixed material is prepared which is subjected to extrusion molding or press molding followed by heat treatment which is not a process disclosed in Apte et al. This is of significance because as the present process as defined in the claims, the pore forming agent that is employed is one of several agent which are a polyvinyl alcohol, an acrylic resin, a vinyl acetate resin or cellulose. None of these materials are described in Apte et al. Accordingly, one of skill in the art would not be led to employ the specific pore forming agents of the present invention in view of disclosures which do not teach these materials. Thus, the combined references are believed not to suggest the invention and withdrawal of the same is respectfully requested.**

This argument is not persuasive. In response to applicant's arguments against Apté et al. individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Apté et al. was cited to teach that pore sizes and shape are determined by the size and shape of an added pore forming agent. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. *In re Keller* 208 USPQ 871, 881; *In re Sernaker* 217 USPQ 1. It is maintained that the disclosure of Apté et al. would have taught one of ordinary skill in the art the relationship between the size and shape of the pore forming agents and the size and shapes of the resulting pores.

**Claims 6 and 15 stand rejected under 35 U.S.C. 103 as being obvious over Niwa et al in view of Apté et al '429 and further in view of Watanabe et al '917. This ground of rejection is respectfully traversed.**

Claim 6 (Claim 15) is directed to a secondary aspect of the invention which more specifically defines the high temperature heat treatment of the present process. As such, the time and temperature conditions of pyrolyzing the green body in the present process are not aspects which are critical to the invention. Further, given that the aspect of Claim 6 is dependent upon a claim that is believed patentably distinguishable over the cited and applied prior art, withdrawal of the rejection is respectfully requested.

This argument is not persuasive for the reasons as stated above.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher A. Fiorilla whose telephone number is (571) 272-1187. The examiner can normally be reached on M-F, 6:30am-3:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven P. Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0651.



**Christopher A. Fiorilla  
Primary Examiner  
Art Unit 1731**

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